

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Photographic Apparatus
Employing Roll Film

We, KODAK LIMITED, a Company registered under the laws of Great Britain, of Kodak House, Kingsway, London, W.C.2, (Assignees of JOSEPH MIHALYI, citizen of the United States of America, of 333, State Street, Rochester, New York, United States of America), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to photographic apparatus employing roll film on a spool having flanges with peripheral rims thereof spaced apart a distance less than the width of the film.

According to the present invention, photographic apparatus employing such a spool of roll film is provided with a film guide roller between the spool and an exposure frame or film gate, the surface of the roller contacted by the film being of greater diameter at its ends than intermediate thereof for the purpose of curving the film transversely as it passes over the roller.

By providing the guide roller adjacent the film spool the film is flexed sufficiently to enable the film to pass freely over the rims of the spool flanges as the film is moved between the film spool and exposure frame or film gate.

In applying the invention to a photographic camera, a film spool inserted in a spool chamber is rotatable by a winding member extending into the chamber into engagement with the spool, and a film guide plate extends from the spool chamber to the roller to guide the film into contact with the latter.

The preferred embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:—

Fig. 1 is a front elevation of a camera.

Fig. 2 is a longitudinal section of the camera illustrated in Fig. 1;

Fig. 3 is a sectional elevation taken on the line III—III of Fig. 2;

Fig. 4 is an enlarged view of part of Fig. 2;

Fig. 5 is an elevation of the film spool and concave roller illustrated in Fig. 4; and

Fig. 6 is an elevation of the film spool showing a projecting film tab.

The camera illustrated comprises a camera body 1 having a shutter 2 supporting an objective 3 on a front wall 4 of the camera in the usual manner. The top wall 5 is provided with a hinge 7¹ which permits an end wall section 7 to swing upwardly to expose a film chamber 13 when a latch 8 is released from a pin 9.

A take-up film chamber 10, as indicated in Fig. 2, includes a substantially cylindrical housing 11 containing a curved leaf spring 12 adapted to assist the end of the film F in coiling up when the film is propelled into the spool chamber 10 from a supply chamber 13. The supply chamber 13 is normally covered by the hinged section 7, but when this section is unlatched a spool designated broadly as S of film F may be inserted axially into the supply chamber 13.

Referring to Fig 6, the film spool comprises a hub member 15 having a trunnion 16 at one end provided with a cross slot 17 adapted to engage a pin 18 of a winding shaft 19 connected to a winding knob 20. Thus, when the film spool S is dropped into the spool chamber, it rides on the pin 19 until the slot 17 is seated on the cross pin 18, thus positioning the film spool in a winding position. When the cover 7 is lowered, the bearing 21 engages the upstanding trunnion 15 to hold the film spool in a winding position.

As the film spool is to be used in a camera it is unnecessary to provide the usual backing paper because the sensitive surface of the film is protected against light by an opaque or substantially opaque backing on the film of any known type. The inner end of the film is preferably attached to the film hub 15.

As indicated in Fig 3, the spool flanges 23 and 24 are provided with rim portions or beads 25 and 26 which are spaced together a distance closer than the width of the film F. These flanges may be made of thin metal which is rigid or, if

desired, which is slightly springy. The beads 25 and 26 will normally hold the film against unwinding as indicated in Fig. 6, but if the film is bowed transversely, it may be unwound from or wound onto the film spool S according to the direction of rotation of the knob 20 which has a frictional contact with a bearing 27 carried by the bottom camera wall 28.

In order to curve the film transversely so that it may pass freely between the beaded edges 25 and 26 of the spool flanges, a guide member is provided adjacent the film spool and according to the invention takes the form of a roller 30, the film contacting surface of which is of greater diameter at its ends 31, for example, one third greater than at the intermediate part 32. The curved surface 33 is concave so that it will bend the film transversely and permit it to be moved easily over the beaded edges 25, 26. The roller 30 may turn on suitable trunnions 34.

The cylindrical spool chamber 13 is provided with an opening 35 through which a curved guide plate 36 passes so that, when the film spool S is turned, the end 37, as indicated in Fig. 6, may come in contact first with the plate 36 and then with the roller 30 which bends the film transversely as indicated in Fig. 5 so that the film F may be moved through the camera. The plate 36 is provided with an exposure aperture 38. A pressure member 41 spring pressed by leaf springs 42 holds the film flat in an exposure position. The plates 36 and 41 extend to an opening 43 in the take-up spool chamber 10 so that as the winding knob 20 is turned the film is guided into the take-up film chamber and is caused to coil on itself by means of the leaf spring 12.

With a camera constructed as above described the operations of loading the camera, making exposures, and unloading the camera are extremely simple. To load, the door 7 is swung open and a spool S of film is placed in the spool chamber 13 with the slot 17 of trunnion 16 engaging the winding pin 18. The cover is then closed. The operator does not need to pay any attention to the position of the film end 37 since, as soon as the knob 20 is turned in the winding direction, the end will engage the curved end 36 of the guide plate and, through its engagement with the curved edge 33 of roller 30, will bow the film transversely so that it may pass freely past the exposure frame 38 and into the spool chamber 10. Exposures may be made on the film as it is moved towards the spool chamber 10 or, if desired, the film may be completely

unwound into the spool chamber 10 after which exposures may be made by rewinding the film back onto the film spool.

After the film has been exposed and rewound upon the spool S, the operator opens the door 7 and can readily remove the exposed film spool either by lifting it out of the spool chamber 13 or turning the camera over so that it will slide out.

Although the concave guide roller has been described and illustrated in connection with a photographic camera, it will be understood that the simplified film feeding means according to the invention may be used with advantage for feeding film from a film spool to the projection position of a film projector or to the exposure position of a photographic contact or enlarging printer.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Photographic apparatus employing a film spool having flanges with peripheral rims spaced apart a distance less than the width of the film and wherein a film guide roller provided between the film spool and an exposure frame or film gate has a film contacting surface of greater diameter at its ends than intermediate thereof so that the film passing from or to said spool is flexed transversely by the roller to permit the film to pass over the rims of the spool flanges.

2. Photographic apparatus according to claim 1, wherein a film guide plate extends from the spool chamber to the roller to guide the film into contact with the latter.

3. A camera according to claim 2, wherein the film spool inserted in a spool chamber is rotatable by a winding member extending into the chamber into engagement with the spool.

4. A photographic camera according to claim 2 or 3, wherein the film guide is extended to a take-up film chamber and is provided with an exposure aperture.

5. A camera according to claim 4, wherein the film is pressed flat at the exposure aperture by a spring pressure plate extending between the guide roller and take-up film chamber.

6. A photographic camera having film spool winding and guiding means constructed and adapted for use substantially as hereinbefore described with reference to Figs. 2-4 of the accompanying drawings.

Dated this 28th day of December, 1942.

RAYMOND E. CROWTHER,

Acting for the Applicants.

FIG. 1.

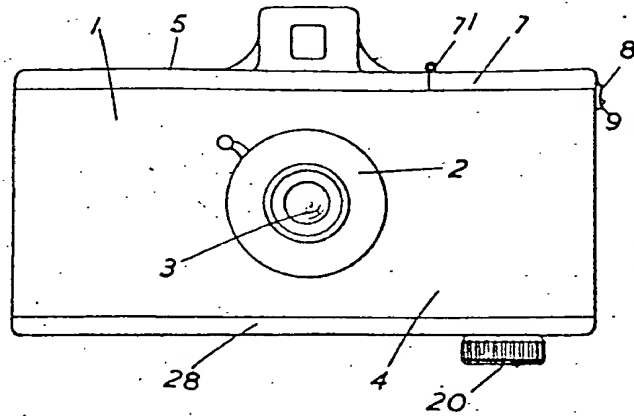


FIG. 4.

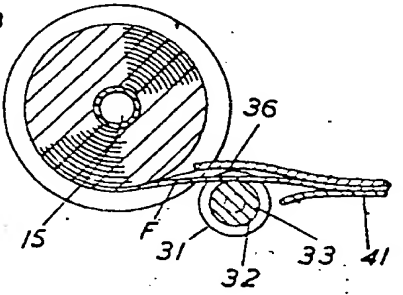


FIG. 2.

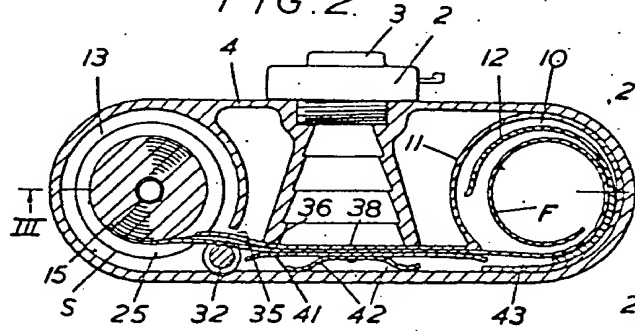


FIG. 5.

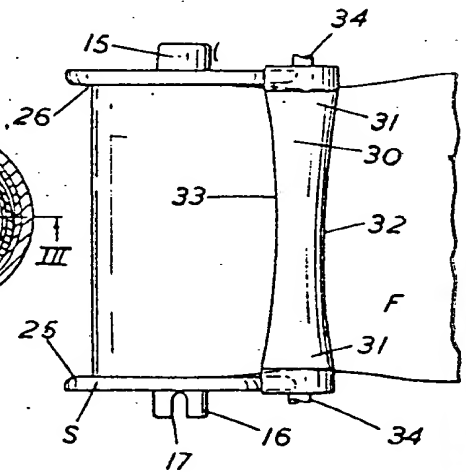


FIG. 3.

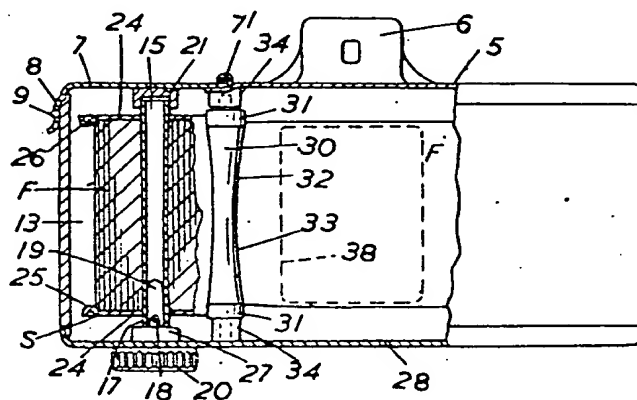
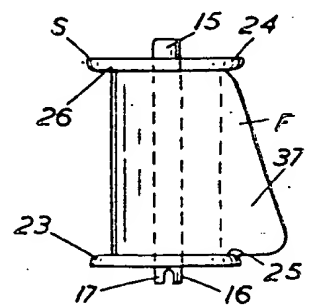


FIG. 6.



[This Drawing is a reproduction of the Original on a reduced scale.]